

ACTUARIAL VALUATION REPORT
FOR THE
CITY OF NEWBURYPORT
CONTRIBUTORY RETIREMENT SYSTEM
AS OF
JANUARY 1, 2004

Prepared for: Mr. Franklin J. Spaulding
Chairman
Board of Retirement
City Hall
60 Pleasant Street
Newburyport, Massachusetts 01950-2621

November 5, 2004

John Hancock

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SUMMARY AND CERTIFICATION

This actuarial valuation report is prepared as of January 1, 2004 for the City of Newburyport, in order to develop a funding schedule for the Retirement System for the fiscal years ending in 2006, 2007 and 2008.

This Summary presents the basic results and describes the changes from the last actuarial valuation, which we prepared as of January 1, 2001. The exhibits which follow contain the details supporting the calculations, the basic information used and the actuarial cost method and assumptions, as well as information for disclosure under GASB Statement No. 25. At the end of the report we have included a comparative "Quick Reference" summary of principal valuation results, which includes results from the prior actuarial valuation.

Pension Appropriation

The Appropriation under the current funding schedule consists of three components: Normal Cost (for the current year of service), Amortization of the Unfunded Actuarial Accrued Liability (for amounts from prior years which are not fully funded), and an allowance for administrative expenses. The Board has retained the funding schedule from the prior actuarial valuation, which calls for amortization payments increasing at the rate of 4.3% per year computed over the period ending with FY2025, (though with the portion of the liability related to the Early Retirement Incentive Programs is to be amortized more quickly). As always, there is the understanding that in future years this schedule can be extended to the maximum length permitted under the law if the need arises.

The following table shows the Appropriation. For comparison purposes we show both the Appropriation based on this year's actuarial valuation and the Appropriation that had been anticipated based on the actuarial valuation done in 2001, which was used until now to determine the Funding Schedule. All figures are assumed payable as of January 15, 2006.

Pension Appropriation for the Fiscal Year Beginning July 1, 2005 (FY2006)

	2004 Actuarial <u>Valuation</u>	Projected from <u>2001 Valuation</u>
Normal Cost	\$ 760,841	\$ 965,608
Amortization Cost	2,259,908	1,602,203
Allowance for Expenses	<u>125,000</u>	<u>247,635</u>
Pension Appropriation	\$3,145,749	\$ 2,815,446

Analysis of the Change in Appropriation Amount

The Pension Appropriation for 2006 is about \$330,000 larger than had been projected in the last valuation. Here, we analyze the reasons.

Actuarial Loss - Between the 2001 and 2004 actuarial valuations, plan experience was less favorable than anticipated, primarily due to unfavorable investment return. The effect of this loss was to increase the Appropriation by about \$223,000.

Expenses – The City's estimate of the anticipated expenses for FY2006 is about \$123,000 less than what was projected from the 2001 actuarial valuation, reducing the Appropriation by that amount. This is because prior estimates included investment-related expenses that should not have been considered.

Early Retirement Incentive Programs – The City offered early retirement incentive programs to employees in both 2002 and 2003. In total, 32 employees took advantage of the offer increasing the Actuarial Accrued Liability by a total of about \$2.1 million. This amount is being amortized in two pieces, both based on 15-year level amortization, starting from the two different dates. The effect was to increase the FY2006 appropriation by about \$269,000, before the assumption change.

Normal Cost and Payroll Changes – The combined effect of an increase in total payroll and the non-investment portion of the loss increased the Normal Cost, net of employee contributions, by \$40,000.

Change in Actuarial Assumptions – Based on PERAC's 2002 Local Experience Study Analysis, we have modified many of the demographic assumptions used in this report. In particular, the mortality tables and the assumption for disablement have been updated, and salary increases and withdrawal rates are now based on service rather than age. Additionally, the interest rate assumption was lowered from 8.5% to 8.0%, reflecting lowered expectations for future investment return. The net effect of these changes was to increase the present value of total projected benefits by about 2.5%.

Due to the operation of the actuarial cost method, this change in assumptions resulted in a decrease of about 10% in the total Normal Cost, which, when leveraged against the Member Contributions, reduced the employer normal cost by 23%. Considering a 6% increase in Actuarial Accrued Liability, the net effect was to reduce the appropriation for FY2006 by about \$79,000 from what it otherwise would have been.

Actuarial Certification

The valuation was performed pursuant to Chapter 32 of the General Laws of the Commonwealth of Massachusetts. To the best of my knowledge, the information in this report and in the accompanying exhibits is complete and accurate, and in my opinion, the assumptions used in the determination of costs are reasonably related to the experience of the plan and to reasonable expectations, and represent my best estimate of anticipated long-term experience under the plan.

In my opinion, this report represents an accurate appraisal of the actuarial status of the Newburyport Retirement System performed in accordance with generally accepted actuarial principles and practices relating to pension plans.

If I can be of any further assistance regarding this valuation, please do not hesitate to contact me.

Respectfully submitted,

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Exhibit I

Basic Actuarial Valuation Results

Shown below are the Actuarial Accrued Liability and Total Normal Cost for the System, calculated as of January 1, 2004. We project these results to January 1, 2005 and compute the Unfunded Actuarial Accrued Liability (which is used in Exhibit II to derive the amortization amounts and in Exhibit III to compute the actuarial gain or loss since the last valuation), and the Employer Normal Cost (which is a component of the Appropriation calculation, shown in Exhibit II).

Note that the negative Actuarial Accrued Liability arises due to an anomaly in the funding method.

	<u>Actuarial Accrued Liability</u>	<u>Normal Cost</u>
A. Active Members		
1. Superannuation	\$21,540,227	\$1,158,987
2. Death	921,462	144,893
3. Disability	1,930,434	291,313
4. Withdrawal	<u>(324,947)</u>	<u>195,905</u>
5. Total	\$24,067,176	\$1,791,098
B. Inactive Members		
1. Retired	\$26,726,128	
2. Disabled	8,069,384	
3. Terminated Vested	81,904	
4. Terminated Non-vested	<u>229,924</u>	
5. Total	\$35,107,340	
C. Unfunded Actuarial Accrued Liability (UAAL)		
1. Total Actuarial Accrued Liability as of January 1, 2004 (A.5 + B.5)	\$59,174,516	
2. Valuation Assets (Exhibit IV)	30,268,510	
3. Unfunded Actuarial Accrued Liability as of January 1, 2004 (1 - 2)	\$28,906,006	
4. Funded Ratio (2 / 1)	51.2%	
D. Employer Normal Cost		
1. Total Normal Cost as of January 1, 2004 (A.5)		\$1,791,098
2. Anticipated Member Contributions for 2004, payable throughout the year		1,156,491
3. Employer Normal Cost Payable January 1, 2004 (1 - 2 / 1.0400)		\$ 679,088
4. Total Normal Cost as of January 1, 2005 (1, with a year's assumed salary increase)		\$1,876,175
5. Anticipated Member Contributions for 2005, payable throughout the year		1,221,079
6. Employer Normal Cost payable January 1, 2005 (4 - 5 / 1.0400)		702,060
7. Employer Normal Cost payable January 15, 2006 (6 x 1.083726)		\$ 760,841

Exhibit I - Continued

Basic Actuarial Valuation Results

E.	Projected Unfunded Actuarial Accrued Liability	
1.	Unfunded Actuarial Accrued Liability as of January 1, 2004	\$28,906,006
2.	Employer Normal Cost as of January 1, 2004	679,088
3.	Estimated Expenses for FY2005	119,332
4.	Projected Pension Appropriation for FY2005 (prior Funding Schedule)	<u>2,885,647</u>
5.	Projected UAAL on January 1, 2005	\$29,195,097
	([1 + 2 + (3 - 4) / 1.083726], all brought forward with interest)	
F.	Amortization of Unfunded Actuarial Accrued Liability	
1.	Components of Unfunded Actuarial Accrued Liability	
a.	Projected UAAL on January 1, 2005 (E.5)	\$29,195,097
b.	Remaining Unfunded Balance for 2002 Early Retirement	1,494,471
c.	Remaining Unfunded Balance for 2003 Early Retirement	<u>678,668</u>
d.	Unfunded Actuarial Accrued Liability for all other benefits (a - b - c)	\$27,021,958
2.	Amortization Payment as of January 1, 2005	
a.	Amortization Payment for 2002 Early Retirement (14 years, 0.00% increase)	\$ 167,847
b.	Amortization Payment for 2003 Early Retirement (15 years, 0.00% increase)	73,415
c.	Amortization Payment for all other benefits (20 years, 4.30% increase)	<u>1,844,051</u>
d.	Total	\$ 2,085,313
3.	Total Amortization Payment on January 15, 2006 (2d x 1.083726)	\$ 2,259,908
G.	Pension Appropriation for FY2006, payable January 15, 2006	
1.	Normal Cost (D.7)	\$ 760,841
2.	Estimated Expenses for FY2006	125,000
3.	Amortization Payment	<u>2,259,908</u>
4.	Total	\$ 3,145,749

Exhibit II

Projected Pension Appropriation

This exhibit shows a projection of the components of the Pension Appropriation from the current fiscal year until the year when the Unfunded Actuarial Accrued Liability is completely amortized. All costs shown are computed assuming payments are made on January 15th.

Fiscal Year Ending	Normal Cost	Amortization of 2002 ERI	Amortization of 2003 ERI	Other Amortization	Expenses	Pension Appropriation	Beg. of FY Unfunded Actuarial Accrued Liability
2006	760,841	181,849	79,539	1,998,520	125,000	3,145,749	30,362,901
2007	789,350	181,849	79,539	2,084,456	130,938	3,266,132	30,449,710
2008	816,349	181,849	79,539	2,174,088	137,158	3,388,983	30,454,397
2009	843,339	181,849	79,539	2,267,574	143,673	3,515,974	30,366,562
2010	870,664	181,849	79,539	2,365,080	150,497	3,647,629	30,174,809
2011	898,431	181,849	79,539	2,466,778	157,646	3,784,243	29,866,658
2012	925,900	181,849	79,539	2,572,849	165,134	3,925,271	29,428,453
2013	954,196	181,849	79,539	2,683,482	172,978	4,072,044	28,845,257
2014	982,390	181,849	79,539	2,798,872	181,194	4,223,844	28,100,743
2015	1,012,479	181,849	79,539	2,919,223	189,801	4,382,891	27,177,075
2016	1,042,922	181,849	79,539	3,044,750	198,817	4,547,877	26,054,778
2017	1,072,993	181,849	79,539	3,175,674	208,261	4,718,316	24,712,598
2018	1,105,110	181,849	79,539	3,312,228	218,153	4,896,879	23,127,351
2019	1,139,421	181,849	79,539	3,454,654	228,515	5,083,978	21,273,756
2020	1,174,460	0	79,539	3,603,204	239,369	5,096,572	19,124,260
2021	1,210,818	0	0	3,758,142	250,739	5,219,699	16,837,316
2022	1,250,492	0	0	3,919,742	262,649	5,432,883	14,289,271
2023	1,291,278	0	0	4,088,291	275,125	5,654,694	11,369,897
2024	1,335,772	0	0	4,264,088	288,193	5,888,053	8,042,284
2025	1,381,343	0	0	4,447,444	301,882	6,130,669	4,266,262
2026	1,430,312	0	0	0	316,221	1,746,533	0

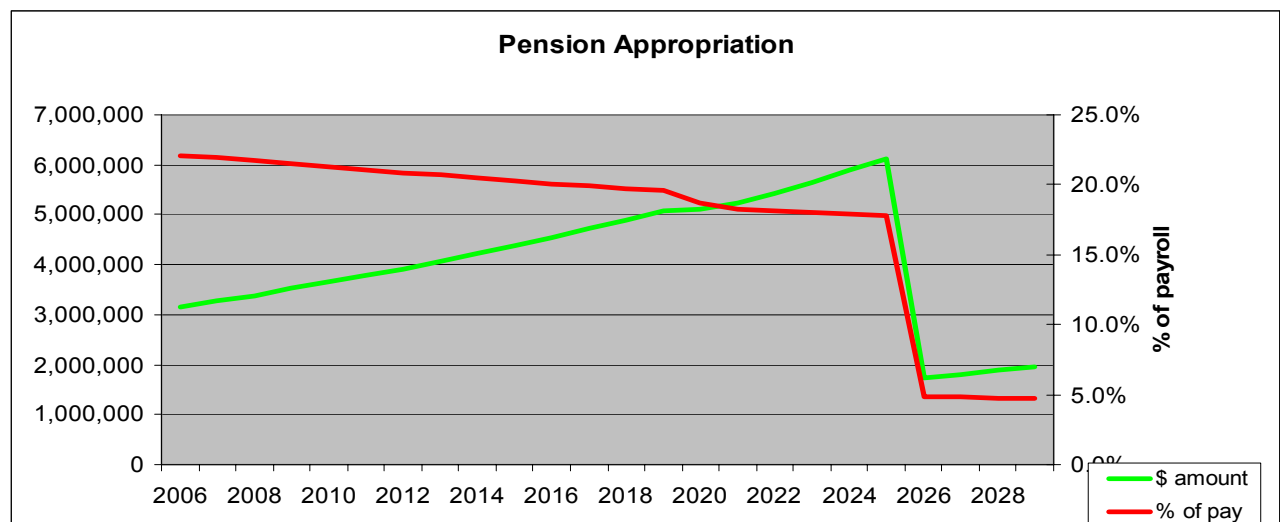


Exhibit III

Actuarial Gain (Loss) Since the Prior Actuarial Valuation

The actuarial gain or loss represents the effect of deviations from the actuarial assumptions since the prior actuarial valuation. *Gains* result in reduced plan costs; *losses* result in increased costs. We measure the gain or loss by comparing the expected and actual Unfunded Actuarial Accrued Liability.

A. Expected Unfunded Actuarial Accrued Liability

1. a. Unfunded Actuarial Accrued Liability (UAAL) as of January 1, 2001	\$19,536,931
b. 2001 Employer Normal Cost (including expenses)	938,912
c. 2001 Appropriation	(2,260,097)
d. Interest on a. and b. to end of year	\$ 1,740,447
2. a. Expected UAAL, January 1, 2002 (1a + 1b + 1c + 1d)	\$19,956,193
b. 2002 Employer Normal Cost (including expenses)	983,201
c. 2002 Appropriation	(2,369,816)
d. Interest on a. and b. to end of year	1,779,848
e. Change due to Early Retirement Incentive Program	\$ 1,427,438
3. a. Expected UAAL, January 1, 2003 (2a + 2b + 2c + 2d + 2e)	\$21,776,864
b. 2003 Employer Normal Cost (including expenses)	1,015,332
c. 2003 Appropriation	(2,586,052)
d. Interest to end of year	1,937,337
e. Change due to Early Retirement Incentive Program	\$ 625,300
4. Expected UAAL, January 1, 2004 (3a + 3b + 3c + 3d + 3e)	\$22,768,781

B. Actual Unfunded Actuarial Accrued Liability (prior to assumption change) \$25,362,425

C. Actuarial Gain (Loss) as of January 1, 2004 (A.4 - B) \$ (2,593,644)

Exhibit IV

Valuation Assets

A. Asset Breakdown by Investment Type as of December 31, 2003*

1. Cash	\$ 61,475
2. Pooled International Equity Fund	4,923,145
3. Pooled Domestic Fixed Income Fund	11,543,716
4. Pooled Alternative Investments	1,805,060
5. PRIT Fund	10,649,178
6. Accounts Receivable	1,285,997
7. Accounts Payable	<u>(61)</u>
Total	\$30,268,510

B. Asset Breakdown by Fund as of December 31, 2003*

1. Annuity Savings Fund	\$ 8,494,782
2. Annuity Reserve Fund	4,530,139
3. Military Service Fund	18,267
4. Pension Fund	4,324,637
5. Expense Fund	0
6. Pension Reserve Fund	<u>12,900,685</u>
Total	\$30,268,510

*As shown on Annual Statement.

Exhibit IV - Continued

C. Reconciliation of assets

Year ending December 31 st	2001	2002	2003
1. Beginning of year	\$25,863,545	\$25,805,721	\$25,188,511
2. Receipts			
Appropriation	\$ 2,260,097	\$ 2,369,816	\$ 2,586,052
Member contributions	913,337	1,017,713	1,056,686
Payments from other systems	285,294	274,908	267,568
Payments from Federal Government	2,938	3,132	3,462
Payments from Commonwealth	<u>142,560</u>	<u>138,749</u>	<u>135,020</u>
Total	\$ 3,604,226	\$ 3,804,318	\$ 4,048,788
3. Disbursements			
Payments to Retirees and other Members	\$ 2,860,344	\$ 3,121,945	\$ 3,675,919
Payments to other systems	170,699	244,371	174,481
Expenses	<u>81,065</u>	<u>68,186</u>	<u>107,126</u>
Total	\$ 3,112,108	\$ 3,434,503	\$ 3,957,526
4. Net investment income	(549,941)	(987,025)	4,988,736
5. End of year (1 + 2 - 3 + 4)	\$25,805,721	\$25,188,511	\$30,268,510

Exhibit V

Information on System Membership

Active Members

Valuation Date 1/ 1/2004

Annual Earnings By Age And Service Groups

SERVICE	0-1	2	3-4	5-6	7-9	10-14	15-19	20-24	25-29	30-34	35-40	OVER	TOTALS
AGE													
0-19	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	8	0	2	1	0	0	0	0	0	0	0	0	11
	235959	0	63291	32785	0	0	0	0	0	0	0	0	332035
	29495	0	31645	32785	0	0	0	0	0	0	0	0	30185
25-29	16	2	6	7	0	0	0	0	0	0	0	0	31
	452637	44618	188424	260527	0	0	0	0	0	0	0	0	946205
	28290	22309	31404	37218	0	0	0	0	0	0	0	0	30523
30-34	13	1	6	5	2	4	0	0	0	0	0	0	31
	280378	37919	232958	148525	98484	137369	0	0	0	0	0	0	935634
	21568	37919	38826	29705	49242	34342	0	0	0	0	0	0	30182
35-39	8	3	2	5	6	8	5	1	0	0	0	0	38
	242826	92654	33543	161347	382765	432742	259660	39014	0	0	0	0	1644551
	30353	30885	16772	32269	63794	54093	51932	39014	0	0	0	0	43278
40-44	13	0	9	8	7	6	6	4	0	0	0	0	53
	387854	0	169843	295016	271988	307740	321778	231802	0	0	0	0	1986020
	29835	0	18871	36877	38855	51290	53630	57950	0	0	0	0	37472
45-49	16	4	5	8	11	4	11	7	8	0	0	0	74
	404699	107906	178144	167910	407095	116831	448291	395956	583402	0	0	0	2810233
	25294	26976	35629	20989	37009	29208	40754	56565	72925	0	0	0	37976
50-54	6	5	6	7	5	6	8	3	3	3	0	0	52
	190644	107907	159095	189947	144012	280252	374069	147586	199834	162876	0	0	1956222
	31774	21581	26516	27135	28802	46709	46759	49195	66611	54292	0	0	37620
55-59	5	2	2	3	2	5	8	3	2	3	1	0	36
	138714	59673	31948	87059	83158	217711	349536	137811	72027	153915	31984	0	1363535
	27743	29836	15974	29020	41579	43542	43692	45937	36013	51305	31984	0	37876
60-64	2	1	1	0	3	1	4	0	2	0	1	0	15
	43749	28318	24625	0	151994	39913	173352	0	77742	0	49117	0	588810
	21874	28318	24625	0	50665	39913	43338	0	38871	0	49117	0	39254
65+	1	0	0	1	0	0	0	1	0	0	0	0	3
	5000	0	0	40301	0	0	0	23559	0	0	0	0	68861
	5000	0	0	40301	0	0	0	23559	0	0	0	0	22954
TOTAL	88	18	39	45	36	34	42	19	15	6	2	0	344
	2382459	478995	1081871	1383418	1539495	1532558	1926686	975727	933004	316791	81101	0	12632104
	27073	26611	27740	30743	42764	45075	45873	51354	62200	52798	40551	0	36721

The first figure in each group is the number of members in that group. The second figure is their annual pay. The third is their average annual pay. The data is classified by attained age and completed years of service. Earnings shown are the reported 2003 pensionable earnings, annualized for those with less than a year of credited service. These were subsequently adjusted for valuation purposes by adding one year's expected salary increase.

Average Age: 44.3
 Average Service: 9.0
 Average Valuation Salary: 38,570
 Average Annuity Savings Fund Balance: 24,011

Exhibit V - Continued

Information on System Membership

Terminated Members

	<u>Number</u>	<u>Annuity Savings Fund Balance</u>		<u>Estimated Benefit at Retirement</u>	
		<u>Total</u>	<u>Average</u>	<u>Total</u>	<u>Average</u>
Vested	2	\$ 56,168	\$28,084	\$23,600	\$11,800
Non-vested	78	229,924	2,948	n/a	n/a
Total	80	\$286,092	\$ 3,576	\$23,600	\$11,800

Members in Pay Status

	<u>Super- annuation</u>	<u>Accidental Disability</u>	<u>Ordinary Disability</u>	<u>Survivors and Beneficiaries</u>	<u>Total</u>
Number	162	27	4	22	215
Average Age	70.7	64.5	66.8	77.8	70.6
Average Benefit	\$ 17,172	\$ 26,416	\$13,722	\$ 7,380	\$ 17,267
Annuity	\$ 379,847	\$ 44,104	\$ 5,129	\$ 15,858	\$ 444,937
Pension from System	2,265,972	617,711	45,012	118,826	3,047,521
Pension from Other Systems	80,533	9,527	0	1,621	91,681
COLA from Commonwealth	55,478	41,880	4,745	26,059	128,163
Total	\$2,781,830	\$713,222	\$54,887	\$162,364	\$3,712,302

Distribution of Benefit by Age

<u>Present Age</u>	<u>Number</u>	<u>Total Benefit</u>	<u>Average Benefit</u>
less than 45	1	\$ 38,211	\$38,211
45-49	3	44,656	14,885
50-54	4	72,981	18,245
55-59	22	598,517	27,205
60-64	51	1,113,793	21,839
65-69	23	535,396	23,278
70-74	29	371,972	12,827
75-79	42	590,912	14,069
80-84	22	225,198	10,236
85-89	11	77,713	7,065
90 and older	7	42,954	6,136
Total	215	\$3,712,302	\$17,267

Due to rounding, numbers may not add up exactly.

Exhibit VI

GASB Statement No. 25 Required Schedules

Paragraphs 37 and 38 of the Statement require two schedules of historical information, covering six years. This exhibit provides the information that is currently available, with estimated values in years where actuarial valuations were not performed.

A. Schedule of Funding Progress

	01/01/2004	01/01/2003	01/01/2002	01/01/2001	01/01/2000	01/01/1999
1. Actuarial Valuation Date	01/01/2004	01/01/2003	01/01/2002	01/01/2001	01/01/2000	01/01/1999
2. Actuarial Value of Plan Assets	30,268,510	25,188,511	25,805,721	25,863,545	25,339,849	25,231,567
3. Actuarial Accrued Liability	59,174,516	51,125,947 *	48,275,607 *	45,400,476	42,531,583 *	41,087,580
4. Unfunded Actuarial Accrued Liability (UAAL)	28,906,006	25,937,435	22,469,886	19,536,931	17,191,734	15,856,013
5. Funded Ratio	51%	49%	53%	57%	60%	61%
6. Annual Covered Payroll	13,268,217	11,866,213 *	11,247,596 *	10,661,228	10,041,055 *	9,517,588
7. Ratio of UAAL to Covered Payroll	218%	219%	200%	183%	171%	167%

B. Schedule of Employer Contributions

	06/30/2005	06/30/2004	06/30/2003	06/30/2002	06/30/2001	06/30/2000
1. Fiscal Year Ending	06/30/2005	06/30/2004	06/30/2003	06/30/2002	06/30/2001	06/30/2000
2. Actuarially Required Contribution	2,885,647	2,586,052	2,369,816	2,260,097	2,155,529	2,019,676
3. Contribution Made	n/a	2,586,052	2,369,816	2,260,097	2,155,529	2,019,676
4. Ratio	n/a	100%	100%	100%	100%	100%

- Notes:
- Items marked with an asterisk (*) are estimated values.
 - Differences between the Actuarially Required Contribution and the contribution made are due to the "Cost Of Benefits Floor" which applied through FY1999. The Actuarially Required Contributions for prior years are based on the PERAC appropriation memoranda.
 - Actuarially Required Contribution for FYE 6/30/2005 is based on the current funding schedule. The current actuarial valuation will first affect FYE 6/30/2006.

Exhibit VII

Summary of Plan Provisions

A. Employee Contributions

Rate: 5%, 7%, 8% or 9%, depending on the employee's hire date (1/1/75, 1/1/84, 7/1/96 cutoffs).

Since the \$30,000 cap on Compensation was repealed by the System, members who joined after January 1, 1979 are required to make extra contributions equal to 2% of compensation in excess of \$30,000.

B. Retirement

1. Eligibility: Earlier of 20 years of service or age 55. If hired after January 1, 1978, the member must have at least 10 years of service to retire, even if over 55.
2. Benefit:
 - a. Benefit Rate x Creditable Service x Average Annual Pay
Benefit rate is 2.5%, grading down by .1% per year less than age 65 (group 1) or age 55 (group 4).
Average Annual Pay is based on the highest 3 consecutive years during all years of participation.
Veterans get extra annual benefit equal to \$15 x years of service up to 20.
 - b. *Maximum benefit* is 80% of Average Annual Pay

C. Vesting

1. Eligibility: Ten years
2. Benefit: Retirement Benefit with Benefit Rate based on age the member begins to receive benefits.

D. Disability - Ordinary

1. Eligibility: Non Veterans: Ten years (local option)
Veterans: Ten years
2. Benefit:
 - a. Benefit Rate x Creditable Service x Average Annual Pay
Pay is capped in same manner as for Retirement Benefit
For *members under age 55*, Benefit Rate for age 55 is used.
For *veterans*, minimum benefit is the sum of the annuity purchasable by accumulated employee contributions, plus 50% of prior year's pay.
 - b. *Maximum* is 80% of Average Annual Pay

Exhibit VII - Continued

E. Disability - Accidental (Job Related)

1. Eligibility: Immediate
2. Benefit: Sum of annuity purchasable by accumulated employee contributions, plus pension equal to 72% of rate of pay.

F. Death - Ordinary

1. Eligibility: Two years
2. Benefit:
 - a. $\text{Benefit Rate} \times \text{Creditable Service} \times \text{Average Annual Pay} \times \text{Option C reduction} \times \frac{2}{3}$
Benefit is payable for *life of the spouse*
For members *under age 55*, Benefit Rate for age 55 is used.
 - b. *Minimum Benefit* = \$3,000 per year

G. Death - Accidental (Job Related)

1. Eligibility: Immediate
2. Benefit: Sum of annuity purchasable by accumulated employee contributions, plus pension equal to 72% of rate of pay.

H. Veterans' Buy Back

Veterans who become vested may purchase up to 4 years of credit for combat duty in the military within 180 days following the date that they vest under the System. Payment of 10% of the compensation at the time the member joined the System must be made for each year to be credited.

I. Cost of Living Adjustment

Each year, the Massachusetts Legislature may choose to grant a cost of living adjustment on the first \$12,000 of benefit. If the System is sponsored by a municipality, adjustments after 1981 were paid for by the Commonwealth via the State Retirement System.

Beginning in 1998, adjustments will no longer be paid by the Commonwealth. The system has elected to accept provisions which make it responsible to pay (and fund for) future cost of living adjustments.

Exhibit VIII

Actuarial Cost Method, Assumptions and Techniques

This exhibit summarizes the method chosen to compute the contribution amounts, and the many assumptions which were used in the calculations. The assumptions are needed to determine the expected plan liability (i.e. the present value of all expected benefits), and the method provides a means of systematically accumulating the funds necessary to support these benefits.

Actuarial Cost Method

This valuation was done using the Entry Age Normal Actuarial Cost Method. Under this method, a level Normal Cost rate is developed for each individual to fund all expected benefits over the participant's career. The Normal Cost is the portion of the present value of expected benefits which the method allocates to the current year. The Actuarial Accrued Liability is the portion of the value of benefits which is allocated to past years and is equal to the hypothetical accumulation of past Normal Costs. The Actuarial Accrued Liability for non-active participants or those assumed to retire on the valuation date is equal to their total present value of benefit.

The excess of the Actuarial Accrued Liability over assets in the plan is called the Unfunded Actuarial Accrued Liability (UAAL), which is amortized over a period of time which depends on the type of funding schedule adopted.

The total cost for a year is equal to the Normal Cost, less expected employee contributions for the year, plus the amortization payment toward the Unfunded Actuarial Accrued Liability and an allowance for anticipated administrative expenses.

Differences between the actual experience of the Plan and the experience projected by the actuarial assumptions result in changes in the Unfunded Actuarial Accrued Liability. An increase results in an Actuarial Loss, and a decrease is called an Actuarial Gain. These amounts are amortized over a period which depends on the funding schedule adopted.

VIII - Continued

Actuarial Funding Assumptions

In order to perform an Actuarial Valuation, it is necessary to make assumptions about future events which would affect plan costs. These include *demographic* factors (rates of mortality, retirement, termination, disability) and *economic* factors (investment return, salary increases). Each assumption is developed to reflect our best estimate of future experience

Economic Assumptions

1. Investment Return: 8.0% (*Prior assumption was 8.5%*)
2. Salary Increases: Rates developed by PERAC in their 2002 Local Experience Study. (*Prior assumption was 5.5%.*)

<u>Years of Service</u>	<u>Group 1</u>	<u>Group 2</u>	<u>Group 4</u>
0	7.00%	7.00%	8.00%
1	6.50%	6.50%	7.50%
2	6.50%	6.50%	7.00%
3	6.00%	6.00%	6.50%
4	6.00%	6.00%	6.00%
5	5.50%	5.50%	6.00%
6	5.50%	5.50%	5.50%
7	5.00%	5.00%	5.50%
8	5.00%	5.00%	5.25%
9	4.75%	5.00%	5.25%
10+	4.75%	5.00%	5.25%

3. Interest Rate Credited to the Annuity Savings Fund (on Employee Contribution Accumulations): 4.0% (*Prior assumption was 5.5%.*)

Demographic Assumptions

1. Mortality Other Than Disabled (pre and post retirement):

Pre-retirement: RP-2000 Employees Table

Post-retirement: RP-2000 Healthy Annuitant Table

(*Prior assumption was the Uninsured Pension 1994 Mortality Table.*)

2. Disabled Mortality (pre and post retirement):

Healthy Post-retirement rates set forward two years. For occupational disabilities, 40% of post disability deaths are assumed to be from the same cause as the disability. (*Prior assumption was the healthy post-retirement table set forward ten years.*)

Exhibit VIII - Continued

Summary of Actuarial Assumptions

3. Termination Rates: Rates developed by PERAC in their 2002 Local Experience Study Analysis. Rates are based on service. (*Prior rates were based on age.*)

Prior Rates (samples)

Age	<u>Groups 1 and 2</u>	<u>Group 4</u>
20	0.1200	.0210
30	0.0555	.0165
40	0.0231	.0056
50	0.0146	.0000
60	0.0000	.0000

Revised Rates

<u>Service</u>	<u>Groups 1 and 2</u>	<u>Group 4</u>	<u>Service</u>	<u>Groups 1 and 2</u>	<u>Group 4</u>
0	0.150	0.015	10	0.054	0.015
1	0.120	0.015	11	0.050	0.000
2	0.100	0.015	12	0.046	0.000
3	0.090	0.015	13	0.041	0.000
4	0.080	0.015	14	0.037	0.000
5	0.076	0.015	15	0.033	0.000
6	0.075	0.015	16-20	0.020	0.000
7	0.067	0.015	21-29	0.010	0.000
8	0.063	0.015	30	0.000	0.000
9	0.059	0.015			

4. Disablement Rates: Rates developed by PERAC in their 2002 Local Experience Study Analysis. Sample rates:

<u>Age</u>	<u>Revised Rates</u>		<u>Prior Rates</u>	
	<u>Groups 1 and 2</u>	<u>Group 4</u>	<u>Groups 1 and 2</u>	<u>Group 4</u>
20	0.0010	0.0000	0.0006	0.0010
30	0.0030	0.0030	0.0011	0.0023
40	0.0101	0.0030	0.0024	0.0087
50	0.0192	0.0125	0.0061	0.0110
60	0.0280	0.0085	0.0123	0.0150

Exhibit VIII - Continued

Summary of Actuarial Assumptions

5. Retirement Rates: Rates developed by PERAC in their 2002 Local Experience Study Analysis

<u>Age</u>	<u>Revised Rates</u>			<u>Prior Rates</u>	
	<u>Groups 1 and 2</u>		<u>Group 4</u>	<u>Groups 1 and 2</u>	<u>Group 4</u>
	<u>Male</u>	<u>Female</u>			
45	0.000	0.000	0.010	0.0000	0.0000
46	0.000	0.000	0.010	0.0000	0.0000
47	0.000	0.000	0.010	0.0000	0.0000
48	0.000	0.000	0.010	0.0000	0.0000
49	0.000	0.000	0.010	0.0000	0.0000
50	0.010	0.015	0.020	0.0000	0.3201
51	0.010	0.015	0.020	0.0000	0.0718
52	0.010	0.020	0.020	0.0000	0.0593
53	0.010	0.025	0.050	0.0000	0.0803
54	0.020	0.025	0.075	0.0000	0.0769
55	0.020	0.055	0.150	0.1255	0.1554
56	0.025	0.065	0.100	0.0321	0.0907
57	0.025	0.065	0.100	0.0310	0.0907
58	0.050	0.065	0.100	0.0334	0.1194
59	0.065	0.065	0.150	0.0348	0.1136
60	0.120	0.050	0.200	0.0784	0.2395
61	0.200	0.130	0.200	0.0692	0.1360
62	0.300	0.150	0.250	0.1511	0.1950
63	0.250	0.125	0.250	0.1071	0.1253
64	0.220	0.180	0.300	0.1037	0.1873
65	0.400	0.150	1.000	0.3568	1.0000
66	0.250	0.200	1.000	0.2214	1.0000
67	0.250	0.200	1.000	0.2159	1.0000
68	0.300	0.250	1.000	0.2164	1.0000
69	0.300	0.200	1.000	0.2536	1.0000
70	1.000	1.000	1.000	1.0000	1.0000

Exhibit VIII - Continued

Summary of Actuarial Assumptions

6. Age that Deferred Vested Benefits Commence: 65
7. Percentage Married: 100% of males, 100% of females, females three years younger than males.
8. Assumptions for children, remarriages: none
9. Percentage of deaths and disabilities assumed occupational:
Groups 1 and 2: 55%, Group 4: 90%.
10. Expenses: Estimated administrative expenses are added to the Pension Appropriation.
11. Cost of Living: Cost of living increases granted prior to July 1, 1981 are included in the calculations. Cost of living adjustments from 1981 through 1997 are assumed to be paid by the Commonwealth. It is assumed that each year in the future, there will be an adjustment of 3%, borne by the System.

Actuarial Procedures and Techniques

1. Employee Data

Employee data used was derived from diskettes provided by the City, supplemented by verbal and written clarification of questions. Data was examined for completeness and consistency.

No information was available on members who have transferred to other systems who have not yet retired. It is implicitly assumed that the liability of this system is offset by other systems' liability for employees who have transferred to this system.

2. Asset Data

Assets were reported as of December 31, 2003. Market values were used.

Exhibit VIII - Continued

3. Adjustment and Projection of Liability Results

Liability calculations (present values, accrued liabilities, normal costs) were made as of January 1, 2004, the census date. Results were projected to January 1, 2005, and used to determine the appropriations for years beginning with FY2006.

The Normal Cost was projected each year by applying the assumed salary increase to the total normal cost and subtracting the projected employee contributions for the year. The projected employee contributions are equal to the projected contributions for the closed group of current participants plus an estimated contribution rate applied to the projected salary for new entrants. The projected salary for new entrants is the amount necessary for total payroll to increase at the assumed salary increase (after considering projected payroll for the closed group of current members). The estimated contribution rate is the rate of a newly hired employee earning the average salary for new entrants. This average salary is projected to increase each year by the assumed salary increase. The net effect of this technique is that the employee contribution, as a percentage of total payroll, will increase by about 1.0% every 10 or 11 years, slowing down as it approaches 10.3% by 2028.

All January 1 results were increased by 12.5 months' interest to bring them forward to January 15th, the date that contributions are assumed to be made.

Exhibit IX

Glossary Of Terms

Actuarial Accrued Liability -- That portion of the Actuarial Present Value of pension plan benefits which is not provided by future Normal Costs or employee contributions. It is the portion of the Actuarial Present Value attributable to service rendered as of the Valuation Date.

Actuarial Assumptions -- In order to fund a plan with reasonably level contributions, one must anticipate the plan's future experience. The actuary does this with a combination of actuarial assumptions, which represent his or her best estimate of future experience. Assumptions for pension plans include estimates of asset appreciation, member turnover, salary increases, pre-retirement mortality, and the cost of an annuity at retirement. The combination of assumptions is intended to reasonably represent a plan's future financial experience over the long term.

Actuarial Cost Method (or Funding Method) -- A procedure for allocating the Actuarial Present Value of all expected pension plan benefits between past and future time periods. This is done via calculation of the Normal Cost and the Actuarial Accrued Liability. Over the years, actuaries have developed various approaches for the systematic accumulation of assets sufficient to provide plan benefits. These approaches or cost methods differ in many respects: some spread costs over an average working lifetime of a group, others spread an individual's cost over that individual's working lifetime; some accumulate assets quickly, others take longer to accumulate sizable assets. The choice of a cost method depends on such factors as the size of the plan and the type of benefit promised.

Entry Age Normal Actuarial Cost Method - Spreads cost for each individual as level percentage of pay. Required under MGL Chapter 32 to develop a Funding Schedule amount.

Actuarial Gain or Loss (or Experience Gain or Loss) -- A measure of the difference between actual experience and that expected based upon the set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Differences due to changes in the Actuarial Assumptions, the Actuarial Cost Method or pension plan provisions would be described as such, rather than as an Actuarial Gain(Loss).

Actuarial Present Value of Benefits -- The dollar value on the valuation date of all benefits expected to be paid to current members based upon the Actuarial Assumptions and the terms of the Plan, taking into account appropriate discounts for the time value of money and the probability that the benefits will be paid.

Exhibit IX - Continued

Actuarial Valuation -- An estimation of the present value of future benefits expected to be provided by a Retirement System, and the allocation of this value between past and future periods. The current year's funding requirement is determined, based on data on existing employees and pensioners in the System, using Actuarial Assumptions and an Actuarial Cost Method, as well as a procedure to determine the amortization payment to be used in the funding schedule.

Amortization Payment -- That portion of the pension plan appropriation which represents payments made to pay interest on and to reduce the Unfunded Actuarial Accrued Liability. Payments can either be "Level" (fixed amount each year), or "Increasing" (amount calculated on the basis that it will increase each year at 4.3%).

Annual Statement -- The statement submitted to PERAC each year that describes the asset holdings and Fund balances as of December 31 and the transactions during the calendar year that affected the financial condition of the retirement system.

Annuity Savings Fund -- The fund in which employee contributions plus interest credited are held for active members and for former members who have not withdrawn their contributions and are not yet receiving a benefit (inactive members).

Annuity Reserve Fund -- The fund into which total accumulated deductions, including interest, is transferred at the time a member retires, and from which annuity payments are made.

Assets -- The total value of the Annuity Savings Fund, Annuity Reserve Fund, Military Service Credit Fund, Pension Fund and Pension Reserve Fund held on behalf of the Retirement System. For valuation purposes, the Expense Fund is not considered an asset.

Cost of Benefits -- The estimated payment from the pension system for benefits for the fiscal year. This is the minimum amount payable during the first six years of a Funding Schedule under Sections 22(6A) and 22D of MGL Chapter 32.

Expense Fund -- The fund into which the appropriation for administrative expenses is paid and from which all such expenses are paid.

Funding Schedule -- The schedule based upon the most recently approved actuarial valuation which sets forth the amount which would be appropriated to the pension system in accordance with Section 22 6A of MGL Chapter 32.

GASB -- Governmental Accounting Standards Board

Exhibit IX - Continued

Normal Cost -- Total Normal Cost is that portion of the Actuarial Present Value of pension plan benefits which is allocated to a particular fiscal year. The Employer Normal Cost is the difference between the total Normal Cost and the amount of the expected employee contributions for the fiscal year.

Pension Fund -- The fund into which appropriation amounts as determined by PERAC are paid and from which pension benefits are paid.

Pension Reserve Fund -- The fund which is credited with all amounts set aside by a system for the purpose of establishing a reserve to meet future pension liabilities. These amounts include excess interest earnings.

PERAC -- The Commonwealth of Massachusetts Public Employee Retirement Administration Commission, which oversees all the contributory retirement systems established under MGL Chapter 32.

Salary Cap -- The \$30,000 limit on compensation considered by the System for benefit purposes for members hired after 1978, unless the System has elected to remove this cap.

Unfunded Actuarial Accrued Liability -- The excess of the Actuarial Accrued Liability over the Assets.

Appendix

Quick Reference Summary

	<u>2001 Valuation</u>	<u>2004 Valuation</u>
Number of Participants (Exh. V)		
Active	325	344
Retirees and Beneficiaries	161	184
Disabled	30	31
Terminated Vested	0	2
Terminated Non-vested	<u>82</u>	<u>78</u>
Total	598	639
Active Members (Exh. V)		
Average Age	45.4	44.3
Average Service	10.4	9.0
Reported Payroll (all members)	\$10,201,975	\$12,632,104
Valuation Payroll (all members)	10,763,083	13,268,217
(members below retirement age)	10,661,228	13,268,217
Average Valuation Salary (all members)	33,117	38,570
Retired and Disabled Members (Exh. V)		
Average Age	71.2	70.6
Average Benefit	\$ 14,231	\$ 17,267
Normal Cost (beginning of year (Exh. I, excluding expenses)		
Total Normal Cost	1,594,392	1,791,098
Anticipated Member Contributions	835,727	1,112,011
Employer Normal Cost	758,665	679,087
Percentage of Projected Valuation Pay	7.0%	5.1%
Actuarial Accrued Liability (Exh. I)		
Active Members	\$21,626,174	\$24,067,176
Retirees and Beneficiaries	17,736,540	26,726,128
Disabled Members	5,788,577	8,069,384
Terminated Vested	0	81,904
Terminated Not Vested	<u>249,185</u>	<u>229,924</u>
Total	\$45,400,476	\$59,174,516
Valuation Assets (Exh. IV)	\$25,863,545	\$30,268,510
Unfunded Actuarial Accrued Liability (Exh. I)	\$19,536,931	\$28,906,006
Funded Percentage (Exh. I)	57.0%	51.2%
Pension Appropriation for FY2006, payable January 15, 2006 (Exh. I)		
Normal Cost	\$ 965,608	\$ 760,841
Estimated Expenses	247,635	125,000
Amortization Payment*	<u>1,871,403</u>	<u>2,259,908</u>
Total Appropriation	3,084,646	3,145,749
Projected Payroll for that FY	\$13,695,338	\$14,224,716
Percentage of Total Projected Payroll for next FY	22.5%	22.0%

*Includes Early Retirement Incentive Programs that occurred in 2002 and 2003.